

## ABSTRACT OF THE DISCLOSURE

The Internally Resilient Railroad Tie consists of two independent booted blocks placed in a tie case, one under each rail. An elastomeric bottom pad is placed under each block inside the boot. The stiffness of the elastomeric bottom pad is varied to compensate for the variations of the overall stiffness of the track that often involves under-lying materials that are difficult to access for modification or replacement. The mass of the block, suspended between the elastomeric bottom pad and the elastomeric rail pad, provides a damper action that along with the enhanced elasticity of the assembly reduces dynamic impact forces and abates vibrations. The damper system reduces the duration and significance of dynamic peak forces and vibrations. However, variations of any or all of the damper system's components can be used to compensate for the variations of the overall dynamic response of the track where needed. A block retainer facilitates lifting whole tie assembly by rail during track installation and maintenance, as well as releasing the blocks during replacements of the bottom elastomeric pad. In service, the block retainer preferably does not restrain elastomers and allows for the rail float. This feature leads to further reduction of track maintenance.

In weak soils, or where the carrying participation of ballast and/or surface soils is undesirable or unfeasible, the internally resilient ties can be placed on piles, pile caps, longitudinal beams, firm foundations, bridge decks and tunnel inverts because the internally resilient tie is capable of substituting for ballast action and for the elastic contributions of subgrade. Internally resilient ties are suitable for transition zones between ballasted and ballastless track zones.